عنوان مقاله:

Spatial and Temporal Variation of Seismic Ambient Noise in Tehran Region for Frequency Range ۱-۳۰ Hz

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خلاصه مقاله:

Because of the use of seismic ambient noise as a low-cost tool for researching subsurface structure and hazard assessments in recent decades, urban seismology has become an active research subject both with seismological objectives, as obtaining better microzonation maps in highly populated areas, and with engineering objectives, as the monitoring of traffic or the surveying of historical buildings. As a result, urban seismology has been used in the metropolis of Tehran, which is one of the world's most populated cities. The city is situated on the southern slopes of the Central Alborz Mountains on Quaternary alluvial deposits, and its southern section is situated on the northwest side of Central Iran's Great Desert, surrounded by active faults such as the Mosha Fault, North Tehran Fault and South Rey Fault.By using cultural noises caused by human activities such as traffic, subway, concerts, and rituals in metropolitan settings, urban seismology explains underlying structures, enhances seismic hazard management, and zoning. As a result of the high level of noise created by human activities in Tehran, as well as the presence of subterranean structures in this metropolis, the necessity of urban seismology and seismic ambient noise approaches is clear. The data from Tehran's accelerometer networks that named Tehran Disaster Mitigation and Management Organization (TDMMO) and the Road, Housing and Urban Development Research Center (BHRC) which are equipped with a Guralp CMG-۵T three component accelerometer and the power spectral density-probability density function (PSD-PDF) approach by PQLX software, which was made available to the seismologist community in June ۲۰۰۴ were utilized in this study to analyze the spatial and temporal fluctuations of seismic ambient noise in the frequency domain. For this purpose, the period of ۱۰ December to ۲۴ December ۲۰۲۰ was investigated. In addition, the effect of the Corona virus pandemic on the frequency and time domain level of seismic ambient noise was explored in period of ۱۶ March to ۲۶ March ۲۰۱۹ and ۱۵ March to ۲۵ March ۲۰۲۰. This period was chosen because the ancient Nowruz festival is in this period.Finally, considering the energy level of cultural noise denoted by the large daytime/nighttime variation with large energy during working hours and much less during nighttime and weekends, most of the stations have been experiencing the lowest level of cultural noise between the hours of ۳:۳۰-۴:۳۰ AM across all three frequency ranges that include human movement, traffic and subway, and in terms of spatial variation, ... D

کلمات کلیدی:
Seismic ambient noise, Power spectral density-probability density function, Spatial and Temporal Variations, Frequency range ۱-۳۰ Hz, Corona pandemic